Wilson (H. Aug.)

SOLUBLE COMPRESSED PELLETS.

A NEW FORM OF REMEDIES FOR HYPODERMIC USE.

BY

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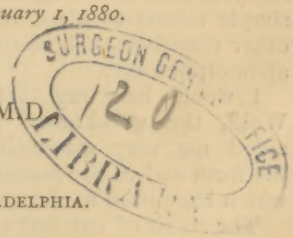
READ BEFORE THE PHILADELPHIA COUNTY MEDICAL SOCIETY, OCTOBER 27, 1880.

Reprinted from the Philadelphia Medical Times, January 1, 1880.



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A NEW FORM OF REMEDIES FOR HYPODERMIC USE.

SOLUTIONS for hypodermic use have been very generally abandoned because the *penicillum*, which so soon forms, renders the use of medicines in this form uncertain, if not dangerous.

Because of the danger and uncertainty, as well as the inconvenience of carrying the medicines in solution, the profession has resorted, where practicable, to the use of powders, which are carried either in the hypodermic or pocket case.

It is as a substitute for the latter that I propose the new form of soluble compressed pellets, because of their convenient size and certainty of contents and action. I have confined my experiments to the salts of morphia because it is the drug most frequently used hypodermically, and because I felt confident that if I could succeed with this drug it would be but a simple matter to place in the same form other remedies, such as strychnia, arsenic, apomorphia, etc.

I would here say that Dr. Lawrence Wolff, the well-known pharmacist, has aided me very materially in perfecting the form and in the numerous experiments which have been made.

The result of our first attempt to obtain a soluble pill I now show you. Besides the morphia it contains one-quarter of a grain of white sugar; but the moisture necessary to roll the pills rendered them difficult to dissolve when required. Then the compressed form was tried with sugar; but the smarting, burning pain which immediately ensued led me to believe that the sugar was an irritant to the tissues, and, instead of aiding, really interfered with the process: therefore sodium chloride was substituted, which I found had not the disadvantages of sugar and possessed merits of its own.

The use of the sodium chloride will be apparent when I say that if morphia salts are compressed alone they become extremely hard and very slowly soluble. Hence the necessity of mixing thoroughly, before compression, some material which at the same time shall give increased bulk, be inert, and have a great affinity for water. The sodium chloride acts as a *disintegrator*, for upon coming in contact with water it readily dissolves and leaves the morphia in a fine state of subdivision, ready to be acted upon by water. The sodium chloride, instead of causing pain or irritation, seems really to assist in promoting absorption. To accomplish the solution usually requires not more than thirty seconds, and may be brought about as follows. The syringe is charged with about twenty minims of water, which is poured into a teaspoon or other convenient receptacle; the pellet, being dropped in, is crushed with the end of the syringe, to which the needle fits, and after all the lumps are broken the solution is drawn up and forced out three or four times, when usually the whole mass will be entirely dissolved and ready for use.

I have experimented with nearly all the salts of morphia with reference to their hypodermic use when combined with sodium chloride, and would express my belief that the muriate is the one to be chosen. It is the salt that the German practitioners have selected, as being less likely to change when kept for a considerable time; and as the acid is the same as that found in sodium chloride there is no chemical incompatibility. It is slightly less soluble than the sulphate; but this slight difference is counterbalanced by the greater certainty of immunity from change.

It is well known that the addition of atropia sulphate greatly increases the hypnotic and anodyne properties of the morphia salts and decreases the tendency to after-headache and constipation. I have,

therefore, used this combination in all my experiments, and would suggest the following formula:

℞ Morphiæ hydrochloratis, gr. ¼, .015
Atropiæ sulphatis, gr. $\frac{1}{150}$, .0004
Sodii chloridi, gr. ¼, .015

Mix and make into compressed pill No. 1.

I claim that the advantages of this method over any other known are—

1st. The convenient size of the pellets.

2d. That they may be used by the mouth if desirable.

3d. Their certainty of contents and dose.

4th. Their certainty and rapidity of action.

Those who have used the hypodermic method, and have often experienced the disadvantages of solutions and the inconveniences of powders, from their increased bulk and from the difficulty of removing all the powder from the paper, will, I trust, accept this my suggestion, and from actual use decide whether it is or is not an improvement upon existing methods.

The following discussion arose on the above paper:

Dr. M. O'Hara approved the suggestion, as he had heard it stated that powders of morphia lose their power after being carried for some time.

Dr. A. L. A. Toboldt suggested tartaric acid as an excipient, instead of sodium chloride, as it renders alkaloids more soluble.

Dr. Charles H. Thomas had been carrying morphia powders for many years, and never had any difficulty in keeping them, nor any evidence of failure. The method of Dr. Wilson, however, is an admirable one. The sodium chloride is not objectionable, as its solution is even less irritating to the tissues than pure water. This form has a marked advantage over the powders in point of solubility, especially if they have been kept for any length of time.

Dr. W. R. D. Blackwood had been in the habit of using morphia powders for hypodermic use for the last fifteen years, and was satisfied that morphia does not deteriorate at all. Moreover, in getting powders from a druggist, it is impossible to tell how long he has had the morphia on hand before dispensing it. In a case of intestinal colic he had made this experiment purposely, and could detect no difference whatever between fresh morphia and the old powders. His method is to carry morphia in one-quarter grain powders, which may be divided or increased as requisite. The syringe is filled with water, which is then ejected into a spoon, the powder dissolved and drawn again into the syringe and deposited beneath the skin. In this way the solution is definite in strength. No more is made than is necessary at the time, and penicillum is avoided. Other agents may be used in the same way. The pellets exhibited will doubtless fulfil a good purpose. During the last few years gelatin disks have appeared, which are valuable for their portability and accuracy in measuring the dose in hypodermic and ophthalmic medication.

Dr. John B. Roberts saw a special advantage in these pellets in hospital practice, where nurses who may be careless have to administer the remedy. The hypodermic syringes are often incorrectly graduated. If solutions are preferred, however, there should be no difficulty in preventing the fungous growth by adding tartaric acid to them; but the present form has especial advantages in its convenience, easy solubility, and accuracy of dose.

Dr. John H. Packard said that for years he had been using powders of the pure alkaloid, instead of the sulphate of morphia. He never had any difficulty in dissolving them. He obtained them in quantities of fifty (half-grain papers), but never noticed any deterioration or change, even after keeping them for years. He was satisfied that there is much inaccuracy in graduating syringes. He preferred the powders, using hot water, and taking the whole, a half, or any part of one of the papers, according to the amount he desired to give, discharging the water upon the powder, and then drawing it up, performing this several times. He has had no difficulty in obtaining a clear solution. He does not, however, use the hypodermic syringe as frequently at present as he formerly did, on account of the strong objections raised against it by persons whose opinion he respects. The disagreeable effects of morphia can generally be overcome by taking a cup of strong coffee.

Dr. Charles B. Nancrede spoke of a case that was very much affected by opium, where the headache and general distress were relieved by half a drachm of the fluid extract of ergot.

Dr. H. A. Wilson, in closing the debate, said that he would like these hypodermic pellets to be submitted to actual trial by the profession, in order to determine whether they are of any real value. He had experimented with different excipients upon his own person, and had found sugar and other substances are slightly irritating, but table-salt is not. The pills are accurately weighed and lightly compressed by Mr. Wolff, who had agreed to furnish them at a cost not greater than that of the powders.

For keeping several varieties in the hypodermic pocket-case, he recommended short tubes with a diaphragm in their middle and containing a different kind in each end.

On motion, a vote of thanks was tendered to Dr. Wilson for his interesting communication.

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